

Formula Sheet for the Class B Exam
Revised 05/02

F032

Desired suspended solids, lbs =
 (Sludge age, days) x (primary effluent solids, lbs/day)

F040

Pollutant emission rate, lbs/day =

$$\frac{(\text{Flow, gpd}) \times (\text{pollutant conc., mg/L}) \times 3.785 \text{ L/gal}}{453,600 \text{ mg/lb}}$$

F041

Coefficient of variation, % =

$$\frac{(\text{Standard deviation of flow rates, gpm}) \times 100\%}{\text{Mean, flow rate, gpm}}$$

F042

Average flow rate, gph =

$$\frac{\text{Cumulative flow volume, gal}}{\text{Time \#2, hr} - \text{time \#1, hr}}$$

F043

Chemical application rate, lbs/day =
 (Flow, MGD) x (chemical dosage, mg/L) x 8.34

F044

Detention time, hr =

$$\frac{(\text{Tank volume, cf}) \times 7.48 \text{ gal/cf} \times 24 \text{ hr/day}}{\text{Flow rate, gpd}}$$

F045

Flux, gpd/sf =

$$\frac{(\text{Flow rate, gpm}) \times 60 \text{ min/hr} \times 24 \text{ hr/day}}{\text{Surface area of membrane, sf}}$$

F046

Hydraulic flow rate, gpm/sf =

$$\frac{(\text{Raw wastewater flow rate, gpm}) + (\text{recirculation rate, gpm})}{\text{Surface area of the trickling filter, sf}}$$

F047

New, or actual, WAS flow rate, MGD =
 Calculated WAS flow, MG x 24
 Actual hours of sludge wasting, hr

F048

Solids produced, lbs/day =
 (BOD removed, lbs/day) x yield factor

F050

Primary sludge, lbs/day =
 Flow rate, MGD x (inflow SS, mg/L - effluent SS, mg/L) x 8.34

F052

Hydraulic loading of a DAF unit, gpd/sf =

$$\frac{\text{Inflow rate, gpm} \times 1440}{\text{Liquid surface area, sf}}$$

F053

Solids loading to a centrifuge, lbs/hr =

$$\text{Sludge flow rate, gal/hr} \times \frac{\text{sludge conc \%}}{100\%} \times 8.34 \text{ lbs/gal}$$

F054

Efficiency of solids removal, % =

$$\frac{(\text{Influent SS, \%} - \text{effluent SS, \%})}{\text{Influent SS, \%}} \times 100 \%$$

F055

Dry polymer, lbs =

$$(\text{Volume of solution, gal}) \times \frac{(\text{polymer conc \%})}{100\%} \times 8.34 \text{ lbs/gal}$$

F016

Average flow rate, MGD =

$$\frac{(\text{Final flow, MG}) - (\text{initial flow, MG})}{\text{Time elapsed, days}}$$